

Low temperature DPF regeneration by delafossite catalysts

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Description

Several Li–Cr delafossite catalysts (LiCrO_2 , $\text{LiCr}_{0.9}\text{O}_2$, $\text{LiCr}_{0.8}\text{O}_2$, $\text{LiCr}_{0.7}\text{O}_2$, $\text{Li}_{0.9}\text{CrO}_2$, $\text{Li}_{0.8}\text{CrO}_2$ and $\text{Li}_{0.7}\text{CrO}_2$) were prepared via a highly exothermic and self-sustaining reaction, the so-called “solution combustion synthesis (SCS)” method, and characterized by means of XRD, BET, FESEM-EDS, H_2 -temperature programmed reduction (TPR) and XPS analyses, as catalysts for the combustion of soot, a major pollutant emitted by diesel engines. These catalysts already showed appreciable activity at 350 °C towards the catalytic combustion of soot even under loose contact conditions. The best prepared catalyst ($\text{LiCr}_{0.9}\text{O}_2$) could ignite soot combustion well below 350 °C, which is inside the range of temperatures reached at the exhaust line of a diesel engine. The correlation between the activity order and the capability to provide surface adsorbed oxygen (O^-) by the prepared delafossite catalysts, enabled by a ...